# Evaluating a web-based iPad tutorial for teachers

Serena Muranaka
University of Hawaii at Manoa
1776 University Avenue
Honolulu, HI 96822
United States
serena8@hawaii.edu

**Abstract:** With advances in technology, schools are starting to integrate this into the classroom. However, technology training is not often provided to teachers. This paper describes the results of designing and evaluating a web-based module designed for public school teachers in Hawaii to educate them in the basics of using an iPad. All participants showed a gain in their understanding of the iPad functions when administered the post-test. Suggestions were also made for improvements. Data and comments from the participants will be used to revise and modify the module so that when it is administered to public school teachers, it will be first-rate. Although, creating a tutorial on basic iPad functionality does not close the gap between teacher training and advances in technology, this tutorial was created to familiarize users with the iPad so that later they can eventually utilize the iPad in different capacities.

## Introduction

Technology in students' lives is rapidly evolving. Students are becoming more tech-savvy because they are more immersed with tech devices from a young age. Because of these advances, schools are starting to realize the need for incorporating technology in their classrooms. Therefore, schools are starting to purchase new technology tools such as, mobile carts with laptops, programs that teach reading and writing, interactive white boards, and other technologies that promote student interactivity. However, when technology tools are purchased, teachers are not adequately trained (Jerald & Orlofsky, 1999; Kent & McNergney, 1999). For example, at a public school in Waipahu, Hawaii, teachers were given an iPad to assist in their teaching, however, none of these teachers received any training on how to operate the iPad. As the technology coordinator for the school, many puzzled teachers confronted me about how to operate the iPad. Therefore I designed this module to assist the teachers in my school. The purpose of this instructional design project is to develop and evaluate a web-based module on how teachers can incorporate the iPad in the elementary classrooms.

## Background

With the invention of mobile hand held devices such as the iPad, schools are starting to realize that there is a huge gap between how students interact with technology at home versus how they are limited with technology at school. According to Marc Prensky (2001a), "Our students have changed radically. Today's students are no longer the people

our educational system was designed to teach" (p. 1). Research by the Bell South Foundation states (2003) students are "increasingly using the Internet and other emerging technologies, developing their own ideas about how to incorporate technology into their learning processes" (p. 10). Because of this, "students think and process information fundamentally differently from their predecessor" (Prensky, 2001a, p.1).

Marc Prensky's studies later reveal that,

> Children who are raised in the digital age develop hypertext minds. They leap around and their cognitive structures are parallel rather than sequential. Our past classroom practices of linear thought processes of teaching sequentially can actually retard learning for brains developed through game and Web-surfing processes on the computer. (Prensky, 2001b, Malleability section, para. 8)

In the past "digital divide" would be described as the technology gap between the schools that have versus the schools that have not. Now the "digital divide" can be characterized as "the disparity between how educators view their use of technology and how students themselves perceive it" (Hudson, 2011, p. 47). Digital natives are the students who grew up with technology all around them and use it to facilitate their learning. These students have spent thousands of hours playing video games, reading emails and instant messages, talking on their cell phone, and watching television and commercials. "Today's college graduate only spends about 5,000 hours reading versus 10,000 hours playing video games" (Prensky, 2001b, para.1). These digital natives have teachers who can be referred to as digital immigrants. Digital immigrants are those who were not born into the digital age and are learning how to become a part of that digital age. Teachers who are digital immigrants view many of these technological advances as distractions in the classroom rather than assets (Barnes & Herring, 2011). Most of their thoughts stem from a disparity between how teachers think they should teach and how students are learning. Teachers think that students are learning the same way as before, but, in actuality, with the advent of new technology, "student's brains are physiologically different from their past counterparts" (Prensky, 2001b, Malleability section, para. 9). As shown in Table 1, you can see the differences between traditional teaching and learning and how it differs from the way students are learning now.

**Table 1.** Differences in teaching and learning, traditional vs. new

| Traditional teaching/learning | New teaching/learning |
|---|---|
| Teacher centered instruction | Student centered instruction/learning |
| Single sense stimulation | Multi-sensory stimulation |
| Single path progression | Multi-path progression |
| Single media | Multi-media |
| Isolated work | Collaborative work |
| Information delivery | Information exchange |
| Passive learning | Active/exploratory/Inquiry based |
| Reactive response | Proactive/planned response |

| | |
|---|---|
| Isolated, artificial context | Authentic, real world context |

Note. Adapted from "Interactive Instruction: Creating Interactive Learning Environments Through Tomorrow's Teachers," by D. Sessoms, 2008, International Journal of Technology in Teaching and Learning, 4(2), p. 90.

Because schools are starting to realize that technology is ever present in their student's lives, they have started to purchase more devices for classroom use. However, even with these new tools on campus, the schools are "not providing teachers with support in the latest technology the way professionals in other fields are supported" (United States Department of Education, 2010, p. 39). Some pre-service programs train teachers, but, for the most part, many teachers are not prepared to use technology in their classroom. Because of the lack of preparation, "technology of everyday life has moved well beyond what educators are taught to and regularly use to support student learning" (USDOE, 2010, p. 39). At Punahou School in Honolulu, HI they have successfully integrated Apple devices into their curriculum. Their success is due to the amount of professional development they have received. They ensure that teachers are well versed in using the device so that they can answer any question that may arise. Some insightful thoughts that Punahou used for their success was "buying technology is not enough" (Scarpiello, 2011, para. 2). They continue by stating that if teachers and students do not learn about all the features and functions of a product, then it is a waste of school money.

As a technology coordinator, I whole-heartedly believe in Punahou's statement. My school decided to buy iPads for every teacher because they thought that it would promote interactivity with the student. The principal and district leaders read countless studies that showed that the integration of the iPad increases student learning and achievement in reading (Bomar, 2006), mathematics (Lary, 2004), social studies (Dixon, 2007), and science (Roschelle, Penuel, Yarnall, Shechtman, and Tatar, 2005). Yet, there were no professional development courses about learning the functionality and features about the iPad. Due to this, I created this module so that teachers at my school will have a brief overview of how to operate their iPad.

When designing my module, I decided to make this web-based, for easy accessibility and so participants could learn concepts over the Internet while navigating on their iPad. This allows participants to learn at a distance from academic centers or work around other commitments like work and family (Greenhalgh, 2001). Web-based modules can "positively challenge a participants by having them actively navigate the online environment and learn new technologies" (Minotti and Giguere, 2001, Cross Platform and Varied Software section, para.1). In addition, I wanted to administer this module to different teachers in the future and I can direct them to this web-based module.

I decided to use some key design elements in order to make my module more effective and appealing to participants. Designing a website that is aesthetically pleasing is important. Udsen and Jorgensen (2005) stated it is important that color used in the website is stable and it helps to separate important words. When I first created this module, I color coded many of the different concept, however, these colors confused the user because they did not symbolize anything. To make my website more clear I made

the headings black and bold, the text related to the headings in a smaller black font, and the navigation on the bottom red.

Simplicity, such as keeping the pages clear and uncluttered, is another key element that I used for the design. I followed this principle to help fine-tune my module pictures. First, I took pictures that showed a finger touching the button on the iPad, but those pictures came out shadowy or blurry. I took another set of pictures that were screen shots of the iPad, and these made the pages very clear and uncluttered (see Figure 1). I wanted the participant to know what button to press so instead of having a pointer, I annotated the picture.

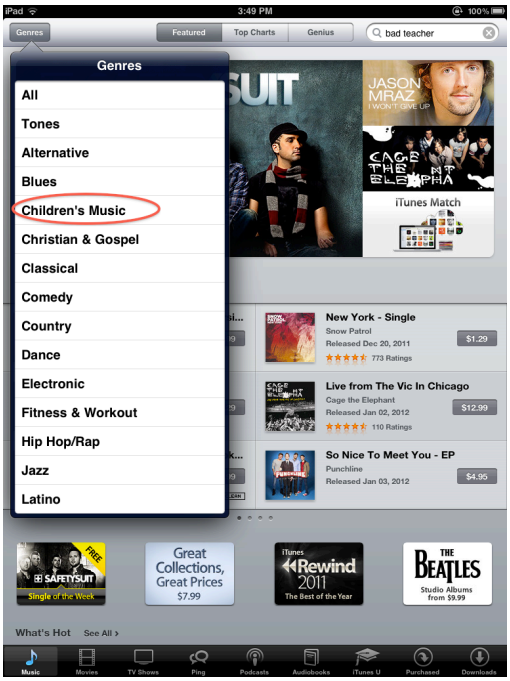


**Figure 1**. Simple design

Linear navigation helps participants who are less experienced and knowledgeable (Hall, Watkins, and Eller, 2003). My module was designed to flow in a linear fashion so participants did not have the choice to skip around from one section to another. The navigation bar of the website displayed tabs for the learning objectives. In addition, there were navigation guidelines that showed what section they were currently in.

## Methodology

*Test Audience of the Instructional Module*

The goal of this instructional module was to develop a web-based tutorial on the iPad for teachers working in the Hawaii Department of Education. Because of the Hawaii Department of Education stringent guidelines about privacy among teachers, I was unable to test it on the teachers at my school. Instead my test group consisted of College of

Education students. Their constructive criticism will be used to revise the module to make it user-friendly for teachers.

In my instructional design, these students acted as my test trial before I administer it to teachers. The module did not require the use of an iPad but if they had one, it could have been useful to guide them through the module.

*Module Development and Design*
This iPad tutorial was different from other sites and books because it was geared more to public school teachers. One of the tabs in the module showcased how to search for Education Apps. The module also showed how to install Lotus Notes, an email program, onto the iPad as well as how to search for Children's Music in iTunes.

*Evaluation elements*
Prior to taking the module, students were given a pre-test to gauge their existing knowledge of the iPad. After completion of the pre-test, they continued on to the four informational tabs which included, 'Basics', 'Internet', 'Music/Photo', and 'Apps'. Each tab had four or five bullet point items to learn about. For example, 'Basics', had an explanation about how to power on, check battery life, set wallpaper, and lock the iPad. After they finished each section, they were given a short quiz about the information presented. This quiz was embedded within the website. Finally, at the end of the module, they received a post-test to see how much they retained. They were also given an attitudinal survey for their thoughts and comments about the module.

When all the data was collected, the pre-test and post-test results were compared using Google Forms. The module test questions were also analyzed using ProProfs. There was a comparison to see if the module difficulty affected the post-test results. The attitudinal data was considered when analyzing the data that came back from students taking the module. All the data will help for future developments. It will give me an idea of what areas I need to work on before I can present my module to teachers at my school.

*One-to-one evaluation*
One peer reviewer took the module prior to the small group evaluation. He is a Software Test Lead at Vocado LLC, whose product is a school management system. He creates test cases via manual and automated to ensure that there are minimal issues when it is released to the client. Software testing involves finding defects and breaking the software intentionally. Because of his expertise in quality assurance of software, this peer reviewer checked the technical aspects of the module. The peer reviewer went through the module as if he was taking it and did the demographic survey, pre-test, embedded tests, post-test, and attitudinal survey. The one-on-one evaluation brought up many elements that needed correction like misplaced icons, broken links, similar quiz questions, and video focusing problems. After this one-to-one evaluation was conducted, problems that were brought up were fixed before delivery to the small group.

*Small group evaluation*

After the one-to-one was conducted I had a small group test my module. College of Education students received an email asking if they would like to participate in my module. I sent the link to my module out to the volunteers. I advised them not to use Firefox because of the problems with the embedded quizzes. I received 13 responses volunteering to participate. Three of the participants chose not to complete the post-test. Therefore, I analyzed the results of the 10 participants, three were male and seven were female. Their ages ranged from 26-60. Four people were in the age range of 26-30, two people 31-40 range, three people in the 41-50 range and one person in the 51-60 age range.

The module was arranged into sections. In the first section, participants had to create a participant ID number so that their data would be anonymous. Then they had to agree to the consent form, do the demographic survey, and pre-test. Then they did the module with the embedded questions for each section and lastly they completed the post-test with an attitudinal survey.

**Results and Findings**

*Analysis of the pre-test and post-test*

Data from the demographic survey showed that six participants already had an iPad whereas four did not. Only three participants were not very comfortable or not at all comfortable with using the iPad. Because the majority of the participants had an iPad, tests results were indicative of this. Participants #1, 3, 4, and 5 had an iPad and were comfortable it, and because of this their pre-test results are rather high (see Figure 2). The three participants, participant #2, 6, and 9, either did not have an iPad or were not comfortable scored relatively low on their pre-test.

All of the participants made improvement from their pre-test to their post-test. Participant #2 made the highest percentage of increase from the pre-test to the posttest. Below is a column graph that shows the comparison between the pre-test results and post-test results (see Figure 2).

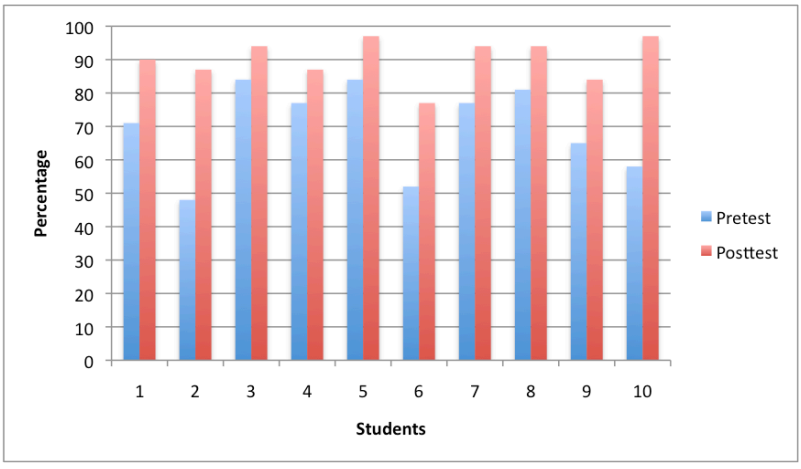


**Figure 2.** Pre-test and Post-test comparison

*Comments from participants about the design of the module*
Four participants used the Contact button to write comments about the module. One participant said that although the module was very clear and easy to follow, the tests seemed very repetitive, a waste of time, and tiresome. This participant also commented that Lotus Notes was not relevant to them and that they were frustrated when they had to choose an answer on the pre-test. They had hoped that instead of just choosing a random answer that they could have chosen "don't know". Another participant said that the quiz questions about the icons could have been improved if there were actual pictures of the icons rather than descriptions. For example if the question was "how do you bookmark a page in Safari?" and the answers given were the open book icon, the arrow, etc. Instead of saying that, picture choices would have been better. Another participant said that the tests, survey, and module were too long. Mentioning the embedded quizzes in the beginning also would have been helpful to one participant. Also some of the questions in the module and tests had answers that were similar so it was hard to decide which choice to pick. Another participant commented that they did not know that Lotus Notes was an email system in the Department of Education.

*Addressing comments from participants*
After reviewing these comments, some of them were very helpful. I am not sure that I can do anything for the participant who called the tests repetitive and a waste of time, since these tests were required in the module. The pre-test provided a baseline of what they knew about the iPad. The module questions gave the participant practice. The post-test checked to see how much the participant learned. Even though I needed to give these tests to check their understanding, one way that I could have alleviated some of the aggravation was to preface the participants ahead of time. I should have told them earlier that there would be three tests, the module questions and pre-test would be very similar in nature. I enjoyed the comment about putting picture choices in the assessment rather than text choices. It would have made the tests and quiz questions easier to visualize. When I revise this module, I hope to find a quiz maker that will allow me to embed pictures because Google Forms and ProProfs did not have that capability. Two participants noted that they did not know what Lotus Notes was or why it was relevant to them. This comment was expected since the module was designed for teachers who use the email program daily yet the module was tested on university students who do not use Lotus Notes.

**Discussion**

*Technical Issues*
An issue that arose was that not all of the data was shown in ProProfs. This may have been due to user error as one user took a longer time to complete a section and this may be why the score were not compared against the other participants.

*Limitations of embedded tests*
If I were to revise and design this in a better way, I would carefully research which company would have the best embedded tests. Proprofs is a wonderful tool to use but

there were some limitations. The tests could not be seen in Firefox and one student still had difficulty with Internet Explorer, so it may not be compatible with that browser either.

*Allowing participants to comment*
The module allowed participants to comment only if they clicked on the 'Comment' tab. This tab let participants express thoughts about the module, but it was another page that they had to go to. For those participants who thought that the module was long and tiresome, probably would not want additional work. It was suggested that a text box in the attitudinal survey be included to type comments.

**Conclusion**

The results from this module will provide a stepping-stone for implementation to teachers in the future. The data collected from the University of Hawaii College of Education students will be highly valuable when revising this module so that I can deliver a high quality product to the teachers. Although the test audience was quite different from the actually target audience, the participants served as a technical guide. Because the majority of participants had or were familiar with the iPad, many of their concerns were about technical aspects of the module, such as repeated questions, design of the module, repetitiveness, and length of module. The participants strongly agreed that the navigation, videos, and the functionality of the website was concise. When all revisions have been made I hope to share this website with teachers at my school so that they can start using their iPad with their classes.

Since this module was designed only to instruct teachers on the basics of using an iPad, there is still much more to be learned to successfully integrate it into the class. The next question will be what else can I do with my iPad. More professional development needs to take place so that the iPad can be used in the class with the students. Some professional development opportunities that could arise is having students create iBooks or projecting your iPad to the Promethean board. As Punahou had stated, if teachers do not learn the ins and outs of a product and its uses, the school is just wasting their money (Scarpiello, 2011). We also need to continue professional development because students are getting better and better at technology and without ongoing professional development, we are falling further behind (USDOE, 2010). We can't just do one project and learn one skill and just put it on the side. Learning technology has to be continuous.

In addition to learning the skills to utilize technology, teachers need to focus on changing the way they instruct the digital native students. They need to change their methodology and content. Teachers need to "learn to communicate in the language and style of their student" (Prensky, 2001a, p. 4). This just means instead of teaching everything slow and sequentially, mix teaching with random access and parallel thoughts (Prensky, 2001a). Legacy content is content that refers to the traditional curriculum, reading, writing, math, and future content is digital and technological (Prensky, 2001a). Somehow we need to merge legacy content with future content so that students are more engaged in the learning process.

**References**

Barnes, J. & Herring, D. (2011). Learning Their Way: Mobile Devices in Education. In M. Koehler & P. Mishra (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2011*, 127-129.

Bell South Corporation. (2003). The Growing Technology Gap Between Schools and Students. Retrieved from: http://www.shorelineschools.org/departments/tech/pdf/BellSouthreport03.pdf

Bomar, L. (2006). iPods as reading tools. *Principal*, *85(5)*, 52–53.

Dixon, A. (2007). Finding your way: GPS and geocaching. *Learning and Leading with Technology*, 34(8), 29–31.

Greenhalgh T. (2001). Computer assisted learning in undergraduate medical education. *British Medical Journal 322*, 40–44.

Hall, R. Watkins, S., & Eller, V. (2003). Model of Web-based design for learning. *Handbook of distance education*, 67-370.

Hudson, Hannah Trierweiler. (2011). The Digital Divide. *Instructor*, *121,* 46-50.

Jerald, C., & Orlofsky, G. (1999). Raising the bar on school technology. *Education Week Technology Counts*, 19, 58-62.

Kent, T. W., & McNergney, R. F. (1999). *Will technology really change education?: From blackboard to web.* Thousand Oaks, CA: Corwin Press.

Lary, L. M. (2004). A baker's dozen: 13 Palm applications for mathematics (and math related!) instruction. *Learning and Leading with Technology, 39(9*), 22–27.

Minotti, J. and Giguere, P. (2003). "The Realities of Web-Based Training". *T.H.E Journal Online. Retrieved from* http://thejournal.com/articles/2003/06/01/the-realities-of-webbased-training.aspx

Prensky, Marc. (2001a). Digital Natives, Digital Immigrants. *On the Horizon, 9 (5),* 1-6.

Prensky, Marc. (2001b). Digital Natives, Digital Immigrants, Part II: Do they really think differently. *On the Horizon, 9(6).*

Roschelle, J., Penuel, W. R., Yarnall, L., Shechtman, N., & Tatar, D. (2005). Handheld tools that "informate" assessment of student learning in science: A requirements analysis. *Journal of Computer Assisted Learning, 21(3*), 190–203.

Sean Scarpiello. (2011, December 30). Re: Punahou's school success with technology [Web log comment]. Retrieved from http://straube.blogspot.com/2011/12/punahou-schools-success-with-technology.html.

Sessoms, D. (2008). Interactive instruction: Creating interactive learning environments through tomorrow's teachers. *International Journal of Technology in Teaching and Learning, 4(2),* 86-96.

Udsen, L., and Jørgensen. A. (2005). The aesthetic turn: Unraveling recent aesthetic approaches to human–computer interaction. *Digital Creativity, 16 (4)*, 205–216.

United States Department of Education. (2010). National Education Technology Plan 2010: Transforming American Education Learning Powered by Technology. Retrieved from http://www.ed.gov/sites/default/files/netp2010.pdf